

REMARKS

At the outset, the Applicants wish to thank Primary Examiner Anita Alanko and Patent Examiner Matthew J. Song for the many courtesies extended to the undersigned attorney during the Personal Interview on April 20, 2004, at the U.S. Patent and Trademark Office. The substance of this Personal Interview is set forth in the Examiner Interview Summary, and in this Amendment.

The amendments to the claims are as follows. During the Personal Interview, three sets of claims were discussed with the Patent Examiner. Independent claims 1 and 11 were as currently pending except that the objected to word "only" was canceled from these claims. The preamble of each claims 1 and 11 was also revised in order to change "comprising" to --consisting of--.

A new set of independent claims 12 and 13 was discussed during the Personal Interview, and these claims 12 and 13 are as follows. Claims 12 and 13 recite the step that there is circulating of the treatment liquids from the baths and then filtering and returning the respective treatment liquid to the corresponding treatment bath. Support for this is found on Page

2 in the second paragraph of the present Specification.

A new second set of two independent claims 14 and 15 was discussed during the Personal Interview with the Patent Examiners. New claim 14 is a combination of original claim 1 and new claim 12 while new claim 15 is a combination of original claim 11 and new claim 13. Thus claims 14 and 15 recite the step of circulating treatment liquids from the bath and then filtering and returning to the corresponding treatment bath plus having the treatment steps form a treatment sequence B₂ which avoids rinsing with water or another treatment liquid.

No new matter has been introduced by this Amendment.

Claims 1 and 11 were rejected under 35 U.S.C. 112, first paragraph and second paragraph. Because the objected to word "only" has been cancelled from both claim 1 and claim 11, this rejection has now been overcome. Withdrawal of this ground of rejection is respectfully requested.

Reconsideration and withdrawal are respectfully requested for the rejection of claims 1-9 and 11 under 35 U.S.C. 103(a) as being unpatentable over *Pirooz et al EP 0701275* in view of

Verhaverbeke et al U.S. Patent No. 6,132,522.

During the Personal Interview, it was respectfully pointed out to the Patent Examiners that new claims 12, 13, 14 and 15 recite novel and nonobvious subject matter, namely the step of circulating treatment liquids from the bath, then filtering and then returning to the corresponding treatment bath. Because these claims 12 to 15 recite novel and nonobvious subject matter, these claims are respectfully submitted to the patentable over the prior art of record, which is *Pirooz* in view of *Verhaverbeke*.

During the Personal Interview, the Patent Examiner stated that with regard to independent claims 1 and 11 that the combined teachings of *Pirooz* and *Verhaverbeke* would render obvious the claimed invention. Specifically, the Patent Examiner refers to pages 9 and 10 of the Brief on Appeal wherein there is a comparison of the teachings of *Pirooz* which include Step A, B, C, and D, and the reference *Verhaverbeke* which includes Step 1, 2, and 3. These were then compared with the claimed procedure of the present invention which includes Step i, ii, and iii. The Patent Examiner stated that referring to *Pirooz* that Step B which is rinsing with water would be eliminated based upon *Verhaverbeke* in column 10, lines 19 to 25 which teach the following:

"Traditionally a DI water rinse is performed between each chemical treatment step. According to the methods of the invention, all of the DI water rinses may be eliminated or may be only one or two rinses may be done between some, but not all, of the chemical treatment steps regardless of the wet processing technique employed."

The Patent Examiner relies upon this teaching in column 10 lines 19 to 25 in order to eliminate Step B of *Pirooz* while at the same time maintaining Step D of *Pirooz*. However Step D of *Pirooz* would be modified further based upon the teaching in *Verhaverbeke* at column 5, lines 5 through 8, as follows:

"A rinse fluid maybe DI water or a very dilute aqueous solution of a chemical (i.e., hydrochloric acid or hydrofluoric acid) to prevent, for example, metallic deposition on the surface of the electronic component precursors."

Thus, the Patent Examiner took the position that rinsing with dilute aqueous hydrochloric acid and would be an equivalent step based upon *Verhaverbeke* in column 5, lines 5 to 8 such that this group of modifications of the teachings of *Pirooz* based upon the teaching of *Verhaverbeke* allegedly renders obvious the claimed invention.

During the Personal Interview, it was argued that, there is

• no motivation to make all of these modifications to Pirooz.

It was pointed out during the Personal Interview that in the present Specification, there is comparative testing which shows the unexpectedly improved results of the claimed invention relative to the prior art. It was pointed out that the comparative testing of the Specification is very relevant and should overcome the teachings of both *Pirooz* and *Verhaverbeke*.

It was also argued during the Personal Interview that the present invention (claims 1, 11, 14, and 15) excludes rinsing with water or some other treatment liquid and the addition of fresh water or other liquids to treatment baths. The Patent Examiner contended that the term "comprising" present in the preamble of the claims does not so exclude having water rinsing steps.

Therefore, in response to this contention of the Patent Examiner, independent claims 1 and 11 have been amended in order to change "comprising" of "consisting of". This clearly supports the concept that it would not be possible to have any water rinsing steps present in the claimed process, such that *Pirooz* would no longer be a relevant prior art reference.

There are four (4) alternative possibilities. Firstly, namely, there is no motivation as to why a person skilled in the art would start with the disclosure of *Pirooz* and modify *Pirooz* in order to eliminate the water rinsing of Step B, based upon *Verhaverbeke* at column 10, lines 19 to 25 and also there would be no motivation to modify the water rinsing Step D of *Pirooz* based upon the teaching of *Verhaverbeke* at column 5, lines 5 to 8 in order to substitute a dilute aqueous solution of hydrochloric acid for the water rinse of *Pirooz*. Secondly, no explanation has been provided by the Patent Examiner as to why a person skilled in the art would not eliminate both Step B and Step D. Thirdly, no explanation has been provided by the Patent Examiner as to why a person skilled in the art would not modify both Step B and Step D. Fourthly, no explanation has been provided by the Patent Examiner as to why a person skilled in the art would not modify Step B and eliminate Step D.

Without a doubt, the only possible rationale for this particular modification of the two prior art references chosen by the Patent Examiner is based upon a hindsight reconstruction of the prior art in light of the inventor's own teachings. Such a hindsight reconstruction is not permitted according to 35 U.S.C. 103.

As previously discussed above, the *Pirooz* reference discloses a sequence of steps A, B, C, and D, with only steps A and C being two steps which comprise a treatment with an aqueous solution containing a chemical substance. However, the treatment sequence which is claimed in the present invention mandatorily requires at least three different treatment steps with an aqueous solution containing a chemical substance.

In addition, there is no motivation to add to the *Pirooz* disclosure any third treatment steps such as the third treatment step claimed. This is because only two treatment steps are necessary according to *Pirooz*.

Since the second reference, namely *Verhaverbeke et al.*, does not disclose the claimed treatment sequence, it is not possible to suggest the claimed invention by any combination of the cited references.

In view of all these reasons set forth above, all the claims must be considered as being non-obvious under 35 U.S.C. 103 with respect to the prior art applied by the Patent Examiner. Withdrawal of this ground of rejection is respectfully requested.

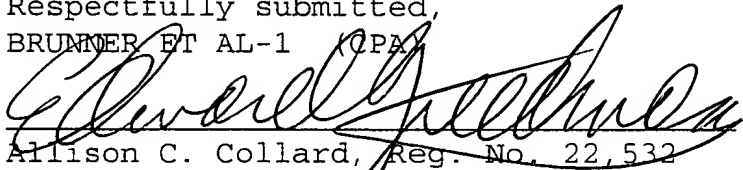
Because four independent claims have been added, there is now a total of six (6) independent claims pending. Enclosed is a check in the amount of (3x\$86) \$258.00 to pay the U.S.P.T.O. fee for adding (3) extra independent claims for a Large Entity.

The Commissioner of Patents and Trademarks is hereby authorized to charge any additionally required fee, or to credit any overpayment to Deposit Account 03-2468.

A prompt notification of allowability is respectfully requested.

Respectfully submitted,
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- Enclosures: (1) Copy Petition 3 Month Extension of Time
(2) Pages 9 and 10 showing comparison of *Pirooz*,
Verhaverbeke, and Invention
(3) Check for \$258.00 to pay for adding (3) extra
independent claims.

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as first class mail in an envelope addressed to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on June 16, 2004.


Marie Guastella

PROZ (columns 2 and 3)

Step A:

HF:H₂O + [HCl] or HF: H₂O +- [H₂O₂] or HF: H₂O + [O₃]

Step B:

Rinsing with H₂O

Step C:

O₃ : H₂O + [HCl] or O₃ : H₂O + [HNO₃]

Step D:

Rinsing with H₂O

The reference Verhaverbeke et al (US-6,132,522) teaches, inter alia, a sequence of the following treatment agents (please see column 9, lines 34 - 42):

Step 1:

HF:H₂O

Step 1:

H₂O₂ : H₂O : NH₄ OH

Step 2:

H₂O₂ : H₂O : HCl or

Step 2:

H₂O₂ : H₂O : HCl

Step 3:

H₂O₂:H₂O:NH₄OH

Step 3:

HF:H₂O

In addition, according to *Verhaverbeke et al.* rinsing of the wafers between steps 1 to 3 is not required.

The present invention claims a procedure comprising a treatment with the following sequence of treatment agents:

Step i:

HF:H₂O + [HCl] + [surfactant]

Step ii:

O₃:H₂O + [HF]

Step iii:

HCl : H₂O + [O₃]

Also any rinsing step between steps i to iii is excluded.

Since the last mentioned feature is a crucial requirement of the present invention, *Verhaverbeke et al.* clearly qualifies to be considered as the closest prior art reference.

A comparison between *Verhaverbeke et al.* and the present invention reveals a significant difference between steps 2 and 3 (*Verhaverbeke*) and steps ii and iii (Invention) respectively.